Evaluation of the efficacy of oral nutrition supplementation on wound healing among selected residents with pressure injuries: A Pilot Study

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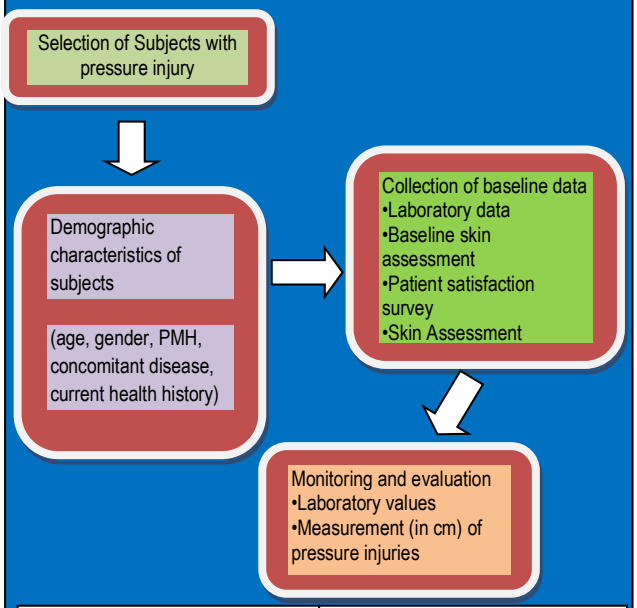
Abstract

Optimizing nutritional status is a key strategy both in preventing and managing pressure injuries. Adequate nutrition addressing macronutrient and fluid needs and determining appropriate micronutrient supplementation along with routine wound care are important factors in pressure injury prevention and healing. Collagen protein stimulates collagen production and has been shown to accelerate the rate of wound healing; while zinc, Vitamin C, E and B12 are important micronutrients in the wound healing process. The association between amino acid supplementation and wound healing, relating supplementation with arginine, glutamine, and beta-hydroxy-beta-methyl-butyrate (HMB) were targeted in many studies. Oral Nutrition Supplement (ONS) used in this study is currently a readily available supplement with blends of arginine, glutamine, collagen, protein, micronutrients (Vitamin C, E, B12 and zinc). Several studies had shown the efficacy of this ONS in wound collagen deposition, significant improvement on wound appearance and wound depth scores, and better quality of life scores among cancer patients. This study aimed to examine the efficacy and effectiveness of ONS on pressure injuries among selected residents with pressure injuries stage 3, 4 and those with multiple pressure injuries in Schulman and Schachne Institute of Nursing and Rehabilitation. If found effective, this may be used as part of medical nutrition therapy (MNT) to prevent further infections and complications associated with pressure injuries. Preliminary findings in this study has shown that among our subjects with complete laboratory data (n=4), 50% had significant improvement on glucose level; while 50% had modest improvement in albumin and protein levels; in terms of measurement of pressure injuries, a decrease in the width and depth of pressure injuries of our subjects with stage 4 and multiple pressure injuries was noted. Our findings revealed that oral nutrition supplement makes a positive contribution on wound healing among our subjects. Inclusion of more subjects in the study may help in establishing more conclusive evidence.

Theoretical Background and significance

Supplementation with the specific ONS has been found to accelerate healing of pressure injury. This study aimed to evaluate the efficacy and effectiveness of an oral nutrition supplement, among selected long-term care residents of Schulman and Schachne Institute for Nursing and Rehabilitation with pressure injuries stage 3,4, multiple and unstageable. If found effective, provision of the supplement will benefit the residents of Schulman and Schachne Institute by increasing the rate of wound healing; prevent sepsis and other infections and complications associated with pressure injuries; decrease morbidity and mortality; and thereby improve quality of life scores of the residents.

Flow Diagram of Clinical Trial Process



RESULTS

Demographic characteristics of subjects

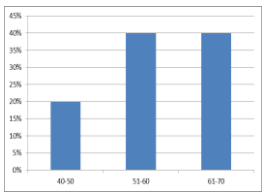


Figure 1. *Percentage distribution of subjects by age*

Figure 2. *Percentage distribution of subjects by gender*

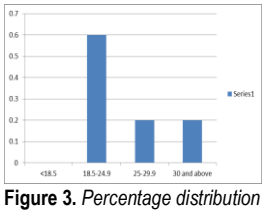


Figure 3. *Percentage distribution of subjects by BMI Classification*

Laboratory Results

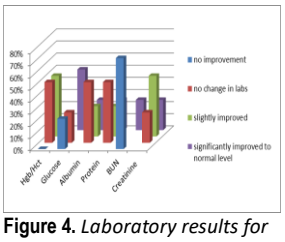


Figure 4. *Laboratory results for glucose, Hgb/Hct, albumin, protein, BUN and Creatinine before and after implementation.*

Measurement of Pressure Injuries

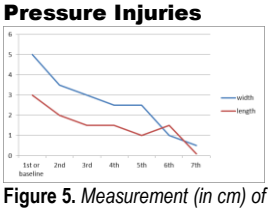


Figure 5. *Measurement (in cm) of pressure injury on subject A with pressure injury stage 4*

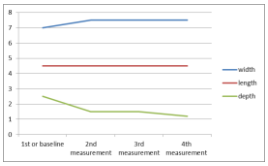


Figure 6. *Measurement (in cm) of pressure injury on subject B with stage 4 multiple pressure injuries*

Discussion

Results showed the demographic characteristics of subjects by age, gender, BMI Classification. Age of subjects ranged from 40 to 70y-old; 20% were among 40-50 years of age; with equal percentage of those in 50-60 (40%) and 60-70 y (40%). Subjects consisted of 40% female and 60% were male with pressure injuries on stage 3, 4 and with multiple pressure injuries. Most subjects (60%) have normal BMI (18.5-24.9), 25% were overweight (25-29.9) and 25% were obese (30 and above).

Laboratory results showed the changes in Hemoglobin/Hematocrit (Hgb/Hct), glucose, albumin, protein, BUN and creatinine levels before and after intervention. Findings revealed 50% had slight improvement in Hgb/Hct levels; 50% had significant improvement on glucose level. On BUN level, 25% of subjects had significant improvement while the remaining 75% did not have any improvement on BUN level. On albumin and protein levels, 25% of subjects had significantly improved, 25% had a slight improvement while 50% of subjects who had normal albumin and protein levels remain unchanged.
Measurement of pressure injuries among our subjects (n=2) revealed significant decrease on the size in centimeter measured in width, length (Figure 5) and depth (Figure 6) during consecutive periods of collection since baseline.

CONCLUSION/ RECOMMENDATION

The significant improvement in glucose level may be associated with Vitamin C supplementation, a component of the ONS used, which has been found in several studies. Modest improvement in protein and albumin levels may indicate improvement in nutritional status which plays a vital role in wound healing. A decrease in the size of pressure injuries among our subjects suggests positive indication for wound healing. Our findings revealed that oral nutrition supplement makes a positive contribution on wound healing among our subjects. Inclusion of more subjects in the study may help in establishing more conclusive evidence. Since our study also included immuno-compromised subjects, findings may be different if our subjects are assigned to different treatment groups.

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